

**REMARKS**

Claims 1 through 20 are currently pending in the application.

This amendment is in response to the Office Action of September 10, 2004.

**Preliminary Amendment**

Applicants note the filing of a Preliminary Amendment on December 15, 2003, which filing was not acknowledged in the outstanding Office Action. Should the Preliminary Amendment have failed to have been entered in the Office file, Applicants will provide a true copy to the Examiner.

**35 U.S.C. § 102(b) Anticipation Rejections**

**Anticipation Rejection Based on Yamazaki et al. (U.S. Patent 5,840,600)**

Claims 1 through 3, 9 and 17 were rejected under 35 U.S.C. § 102(b) as being anticipated by Yamazaki et al. (U.S. Patent 5,840,600).

Applicants assert that a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

After carefully considering the cited prior art, the rejections, and the Examiner's comments, Applicants have amended the claimed invention to clearly distinguish over the cited prior art.

Turning to the cited prior art, the Yamazaki et al. reference describes forming an insulating film for a thin film transistor by oxidation of a silicon film at 500°C to 700°C or an insulating film composed mainly of silicon oxide deposited by physical vapor deposition or chemical vapor deposition and annealing the resulting film at 400°C to 700°C in a highly reactive atmosphere of nitrogen oxide which is photoexcited or photodecomposed by ultraviolet rays. The modified silicon oxide film is used as the gate insulating film for a thin film transistor.

Applicants assert that the Yamazaki et al. reference does not and cannot anticipate the presently claimed inventions of presently amended independent claims 1, 9, and 17 of the present

application because the Yamazaki et al. reference does not identically describe the elements of the presently claimed inventions in as complete a detail as is contained in the claims. For instance, Applicants assert that the Yamazaki et al. reference does not identically describe the elements of the presently claimed inventions of presently amended independent claims 1, 9, and 17 calling for “providing a gas atmosphere of N<sub>2</sub>O, the gas atmosphere of N<sub>2</sub>O having a pressure of at least about five atmospheres for contacting at least a portion of the silicon substrate using a catalytically disassociated gas atmosphere of N<sub>2</sub>O” and “contacting a portion of the gas atmosphere of N<sub>2</sub>O with a catalytic matrix consisting of one or more metals for forming a catalytically disassociated gas atmosphere of N<sub>2</sub>O for contacting at least a portion of the silicon substrate”. In contrast to the presently claimed inventions of presently amended independent claims 1, 9, and 17, the Yamazaki et al. reference describes an insulating film for a thin film transistor by oxidation of a silicon film at 500°C to 700°C or an insulating film composed mainly of silicon oxide deposited by physical vapor deposition or chemical vapor deposition and annealing the resulting film at 400°C to 700°C in a highly reactive atmosphere of nitrogen oxide which is photoexcited or photodecomposed by ultraviolet rays. Such is not the presently claimed inventions of presently amended independent claims 1, 9, and 17.

Therefore, presently amended independent claims 1, 9, and 17 are allowable as well as dependent claims 2 through 8, 10 through 16, and 18 through 20 therefrom.

### **35 U.S.C. § 103(a) Obviousness Rejections**

Obviousness Rejection Based on Yamazaki et al. (U.S. Patent 5,840,600) in view of Kamiyama (U.S. Patent 5,508,221)

Claims 4 and 12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamazaki et al. (U.S. Patent 5,840,600) in view of Kamiyama (U.S. Patent 5,508,221). Applicants respectfully traverse this rejection, as hereinafter set forth.

Applicants assert that to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the cited prior art reference must teach or suggest all of

the claim limitations. Furthermore, the suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure.

After carefully considering the cited prior art, the rejections, and the Examiner's comments, Applicants have amended the claimed invention to clearly distinguish over the cited prior art.

Turning to the cited prior art, the Yamazaki et al. reference teaches or suggests forming an insulating film for a thin film transistor by oxidation of a silicon film at 500°C to 700°C or an insulating film composed mainly of silicon oxide deposited by physical vapor deposition or chemical vapor deposition and annealing the resulting film at 400°C to 700°C in a highly reactive atmosphere of nitrogen oxide which is photoexcited or photodecomposed by ultraviolet rays. The modified silicon oxide film is used as the gate insulating film for a thin film transistor.

The Kamiyama reference teaches or suggests a rapid thermal nitriding treatment of a polycrystalline film using lamp annealing in an ammonium gas with a temperature suitable being 800°C to 1100°C. Also, suggested is the use of a nitrous oxide gas for a treatment.

Applicants assert that the dependent claims 4 and 12 are allowable as depending from allowable independent claims 1 and 9 as discussed herein. Further, Applicants assert that any combination of the cited prior art fails to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding the presently claimed inventions of presently amended independent claims 1 and 9 because, at the very least, any combination of the cited prior art does not teach or suggest all the claim limitations of the presently claimed inventions. Applicants assert that any combination of the cited prior art fails to teach or suggest the claim limitations of presently amended independent claims 1 and 9 calling for "providing a gas atmosphere of N<sub>2</sub>O, the gas atmosphere of N<sub>2</sub>O having a pressure of at least about five atmospheres for contacting at least a portion of the silicon substrate using a catalytically disassociated gas atmosphere of N<sub>2</sub>O" and "contacting a portion of the gas atmosphere of N<sub>2</sub>O with a catalytic matrix consisting of one or more metals for forming a catalytically disassociated gas atmosphere of N<sub>2</sub>O for contacting at least a portion of the silicon substrate".

Therefore, presently amended independent claims 1 and 9 are allowable as well as dependent claims 4 and 12 therefrom.

Rejection Based on Yamazaki et al. (U.S. Patent 5,840,600) in view of Okudaira (U.S. Patent 6,407,419)

Claims 5 and 13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamazaki et al. (U.S. Patent No. 5,840,600) in view of Okudaira (U.S. Patent No. 6,407,419). Applicants respectfully traverse this rejection, as hereinafter set forth.

Applicants again assert that to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the cited prior art reference must teach or suggest all of the claim limitations. Furthermore, the suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure.

After carefully considering the cited prior art, the rejections, and the Examiner's comments, Applicants have amended the claimed invention to clearly distinguish over the cited prior art.

Turning to the cited prior art, the Yamazaki et al. reference teaches or suggests forming an insulating film for a thin film transistor by oxidation of a silicon film at 500°C to 700°C or an insulating film composed mainly of silicon oxide deposited by physical vapor deposition or chemical vapor deposition and annealing the resulting film at 400°C to 700°C in a highly reactive atmosphere of nitrogen oxide which is photoexcited or photodecomposed by ultraviolet rays. The modified silicon oxide film is used as the gate insulating film for a thin film transistor.

The Okudaira reference teaches or suggests an oxidizing atmosphere for annealing the upper surface of a plug using a lamp annealing apparatus and an atmosphere of N<sub>2</sub>O at 550°C for 60 seconds.

Applicants assert that the dependent claims 5 and 13 are allowable as depending from allowable independent claims 1 and 9 as discussed herein. Further, Applicants assert that any combination of the cited prior art fails to establish a *prima facie* case of obviousness under

35 U.S.C. § 103 regarding the presently claimed inventions of presently amended independent claims 1 and 9 because, at the very least, any combination of the cited prior art does not teach or suggest all the claim limitations of the presently claimed inventions. Applicants assert that any combination of the cited prior art fails to teach or suggest the claim limitations of presently amended independent claims 1 and 9 calling for “providing a gas atmosphere of N<sub>2</sub>O, the gas atmosphere of N<sub>2</sub>O having a pressure of at least about five atmospheres for contacting at least a portion of the silicon substrate using a catalytically disassociated gas atmosphere of N<sub>2</sub>O” and “contacting a portion of the gas atmosphere of N<sub>2</sub>O with a catalytic matrix consisting of one or more metals for forming a catalytically disassociated gas atmosphere of N<sub>2</sub>O for contacting at least a portion of the silicon substrate”.

Therefore, presently amended independent claims 1 and 9 are allowable as well as dependent claims 5 and 13 therefrom.

Obviousness Rejection Based on Yamazaki et al. (U.S. Patent 5,840,600) in view of Laia, Jr. et al. (U.S. Patent 5,783,335)

Claims 7, 8, 15, 16, 19 and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamazaki et al. (U.S. Patent No. 5,840,600) in view of Laia, Jr. et al. (U.S. Patent No. 5,783,335). Applicants respectfully traverse this rejection, as hereinafter set forth.

Applicants yet again assert that to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the cited prior art reference must teach or suggest all of the claim limitations. Furthermore, the suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure.

After carefully considering the cited prior art, the rejections, and the Examiner's comments, Applicants have amended the claimed invention to clearly distinguish over the cited prior art.

Turning to the cited prior art, the Yamazaki et al. reference teaches or suggests forming an insulating film for a thin film transistor by oxidation of a silicon film at 500°C to 700°C or an insulating film composed mainly of silicon oxide deposited by physical vapor deposition or chemical vapor deposition and annealing the resulting film at 400°C to 700°C in a highly reactive atmosphere of nitrogen oxide which is photoexcited or photodecomposed by ultraviolet rays. The modified silicon oxide film is used as the gate insulating film for a thin film transistor.

The Laia et al. reference teaches or suggests a process for coating a substrate with diamond or diamond like material.

Applicants assert that the dependent claims 7, 8, 15, 16, 19 and 20 are allowable as depending from allowable independent claims 1, 9, and 17 as discussed herein. Further, Applicants assert that any combination of the cited prior art fails to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding the presently claimed inventions of presently amended independent claims 1 and 9 because, at the very least, any combination of the cited prior art does not teach or suggest all the claim limitations of the presently claimed inventions. Applicants assert that any combination of the cited prior art fails to teach or suggest the claim limitations of presently amended independent claims 1, 9, and 17 calling for “providing a gas atmosphere of N<sub>2</sub>O, the gas atmosphere of N<sub>2</sub>O having a pressure of at least about five atmospheres for contacting at least a portion of the silicon substrate using a catalytically disassociated gas atmosphere of N<sub>2</sub>O” and “contacting a portion of the gas atmosphere of N<sub>2</sub>O with a catalytic matrix consisting of one or more metals for forming a catalytically disassociated gas atmosphere of N<sub>2</sub>O for contacting at least a portion of the silicon substrate”.

Therefore, presently amended independent claims 1, 9, and are allowable as well as dependent claims 7, 8, 15, 16, 19 and 20 therefrom.

### **Objected to Claims**

Applicants appreciate the indication of allowable subject matter in dependent claims 6, 14, and 18 if rewritten in independent form to include all of the limitations of the base claim and any intervening claims. However, Applicants have not amended such claims as presently amended independent claims 1, 9, and 17 are allowable for the reasons set forth herein.

Applicants submit that claims 1 through 20 are clearly allowable over the cited prior art.

Applicants request the allowance of claims 1 through 20 and the case passed for issue.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "James R. Duzan". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

James R. Duzan

Registration No. 28,393

Attorney for Applicants

TRASKBRITT

P.O. Box 2550

Salt Lake City, Utah 84110-2550

Telephone: 801-532-1922

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JRD/dlm:dlh

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